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EXAMINER

DEJESUS, L

ART UNIT

PAPER NUMBER

2859

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

09/323,650

Applicant(s)

CHUBB ET AL.

Examiner

Lydia M. De Jesús

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1-3, 5, 10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Mihalczo et al. [hereinafter Mihalczo].

Mihalczo discloses an optical temperature sensor comprising an emitter [12] having a selective energy emission band, said emitter converting thermal energy to energy within said emission band within said emission band in response to a temperature of said emitter (see Figure 3); a light pipe [14] having a first end and a second end, said first end communicating with said emitter; an optical bandpass filter [18] communicating with said second end, said filter having a pass band corresponding to said emission band; and a detector [16] communicating with said filter, said detector detecting said emitter energy as a measure of said temperature (Col. 4, lines 31-32).

Said emitter contains a rare earth element (Col. 2, lines 54-57, and Col. 3, lines 7-15) and is composed of a rare earth oxide i.e.,  $Y_2O_3$ . Mihalczo also shows selecting an emitter being a high temperature host material which is doped with a rare earth element i.e.,  $Y_2O_3 : Gd$ .

Mihalczo teaches the use of a light pipe composed of sapphire or quartz (Col. 3, lines 18-20).

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3. Claims 1-3, 10 and 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Tregay.

Tregay discloses an optical temperature sensor comprising an emitter (in recess 28a or 28b) having a selective energy emission band, said emitter converting thermal energy to energy within said emission band in response to a temperature of said emitter; a light pipe [22] having a first end and a second end, said first end communicating with said emitter; an optical bandpass filter [42] communicating with said second end, said filter having a pass band corresponding to said emission band (see Column 5, lines 46-66); and a detector [44] communicating with said filter, said detector detecting said emitted energy as a measure of said temperature.

Said emitter contains a rare earth element, in particular is composed of a rare earth oxide i.e., yttrium oxide (Col. 5, lines 14-18). Said light pipe is composed of sapphire for high temperature operation of the sensor in the range of for example 1000° C to 2000 ° C or approximately 1273 K to 2273 K (Column 5, lines 34-41).

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Wissinger.

Wissinger discloses an optical temperature sensor comprising an emitter (laser diode devices [12]) having a selective energy emission band (Col. 3, lines 18-24), said emitter converting thermal energy to energy within said emission band in response to a temperature of said emitter (see for example Col. 1, line 65 through Col. 2, line 3); a light pipe [14] having a first end and a second end, said first end communicating with said emitter; an optical bandpass filter [in bandpass filter array 22] communicating with said second end, said filter having a pass band corresponding to said emission band (Col. 4, lines 4-12); and a detector [18]

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communicating with said filter, said detector detecting said emitted energy as a measure of said temperature.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 4, 7-9 and 13-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Mihalczo in view of Milstein et al. [hereinafter Milstein].

Mihalczo discloses an optical temperature sensor as claimed, as stated above in paragraph 2, and further teaches that the sensor can be customized for a particular temperature range of operation by choosing an appropriate thermophosphor material (see Col. 4, lines 24-30), but fails to disclose the material for the emitter being one among the group of a rare earth aluminum garnet, ytterbium oxide, or yttrium aluminum garnet doped with a rare earth element i.e., yttrium

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aluminum garnet doped with ytterbium. Mihalczo also lacks a detector being a silicon detector, a lead sulfide detector or an indium antimonide detector and discloses that depending on the thermophosphor material selected, temperature can be monitored in environments up to 1500° C (approximately 1773 K).

Milstein shows a sensor for converting thermal energy into electricity by applying thermal energy to a selective emitter and detecting the emitted radiation from the emitter with a radiation detector. Among the materials shown by Milstein for the selective emitter are ytterbium oxide and Nd:YAG (see also line 63 of Column 5 through line 3 of Column 6).

Therefore, the particular emitter material, absent any criticality, is only considered to be the use of a "preferred" emitter material out of a plurality of well known materials commonly known in the art to emit radiation as a response to thermal energy applied to the material that a person having ordinary skill in the art at the time the invention was made would have find obvious to provide using routine experimentation based, among other things, on the intended use of applicant's apparatus, i.e., suitability for the intended use of applicant's apparatus. See In re Leshin, 125 USPQ 416 (CCPA 1960) where the court stated that a selection of a material on the basis of suitability for the intended use of an apparatus would be entirely obvious.

Mihalczo discloses the use of a photodiode or a photomultiplier tube as the detector of the disclosed optical temperature sensor. Milstein teaches the use of a silicon photodiode as the detector in the sensor configuration shown. Hence, the particular radiation detecting means configuration claimed by applicant i.e., silicon detector/ lead sulfide detector/ indium antimonide detector, absent any criticality, is considered nothing more than one of numerous radiation detecting means configurations that a person having ordinary skill in the art will find obvious to

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provide for the purpose of detecting the emitted radiation from the emitter of the temperature sensor.

Furthermore, as discussed above the temperature range of operation of the sensor will depend on the material selected for the emitter and Milstein further teaches (see Column 34, lines 34-50) that some of the selective emitter materials already known in the art will perform in environments above 2000° C (approximately 2215 K).

Therefore, the temperature range of operation of sensor resulting from the combination of Mihalczo and Milstein will depend on the selected material for the emitter and by selecting an appropriate emitter will operate above 2000 K, as taught by Milstein.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mihalczo in view of Rusanov et al. [hereinafter Rusanov].

Mihalczo discloses an optical temperature sensor as claimed, as stated above in paragraph 2, but fails to disclose said light pipe being composed of yttrium oxide.

Rusanov teaches that it is very well known in the art that yttrium oxide is one among known materials used for making light pipes i.e., optic fibers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the light pipe of the optical temperature sensor of Mihalczo for a light pipe composed of yttrium oxide since the use of this particular material, absent any criticality, is only considered to be the use of a "preferred" material out of a plurality of well known materials commonly selected for manufacturing light pipes that a person having ordinary skill in the art at the time the invention was made would have find obvious to provide using routine experimentation based, among other things, on the intended use of applicant's apparatus,

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i.e., suitability for the intended use of applicant's apparatus. See In re Leshin, 125 USPQ 416 (CCPA 1960) where the court stated that a selection of a material on the basis of suitability for the intended use of an apparatus would be entirely obvious.

### ***Response to Arguments***

9. Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Paz-Pujalt et al. disclose a device for converting invisible and visible radiation to visible light and/or UV radiation. Chen et al. disclose selective infrared line emitters. Allison et al. disclose high temperature thermometric phosphors. Djeu discloses a fiber-optic temperature sensor.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lydia M. De Jesús whose telephone number is (703) 306-5982. The examiner can normally be reached on Mondays-Fridays (8:30-6:00), alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F.F. Gutierrez can be reached on (703) 308-3875. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 305-3431 for After Final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

LDJ  
May 17, 2001



Diego F.F. Gutierrez  
Supervisory Patent Examiner  
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